

CLAIMS

What is claimed is:

1. A low-voltage excited red phosphor comprising:
a matrix including an oxide of an alkali earth metal and titanium; and
doping elements including a rare-earth element, a group 13 element, and Zn.
2. The phosphor according to claim 1, wherein the alkali earth metal is at least one metal selected from the group consisting of Mg, Sr, Ca, Ba, or a combination thereof.
3. The phosphor according to claim 1, wherein the rare-earth element is at least one element selected from the group consisting of Ce, Eu, Tb, Er, Tm, Pr, Dy, Gd, or a combination thereof.
4. The phosphor according to claim 1, wherein the rare-earth element is doped in an amount of 0.05 to 5 mol% of the phosphor.
5. The phosphor according to claim 1, wherein the group 13 element is at least one element selected from the group consisting of Al, Ga, In, Tl, or a combination thereof.
6. The phosphor according to claim 1, wherein the group 13 element is doped in an amount of 0.05 to 130 mol% of the phosphor.
7. The phosphor according to claim 1, wherein Zn is doped in an amount of 0.01 to 100 mol% of the phosphor.
8. A method of preparing the low-voltage excited red phosphor comprising:
mixing a salt of an alkali earth metal and titanium oxide to obtain a mixture;
adding a rare-earth element-containing compound, a group 13 element-containing compound and a Zn-containing compound to the mixture; and
firing the mixture at a temperature in the range of 1100-1400°C.

9. The method according to claim 9, wherein the Zn-containing compound is at least one Zn-containing salt selected from the group consisting of ZnO, ZnBr, ZnCl₂, Zn(NO₃)₂, Zn(NO₃)₂·6H₂O, Zn(PO₄)₂, ZnSO₄, and Zn(OH)₂.